FLUKE®

Instruction Sheet

80PK-3

Type K Thermocouple Probe

(2) Surface mount

WARNING

TO AVOID ELECTRICAL SHOCK, DO NOT USE THIS PROBE WHEN VOLTAGES EXCEEDING 24V AC RMS OR 60V DC ARE PRESENT. THE PROBE TIP IS ELECTRICALLY CONNECTED TO THE OUTPUT TERMINALS.

INTRODUCTION

The 80PK-3 Type K Thermocouple Surface Probe is designed for measuring the temperature of flat or slightly convex surfaces, with an exposed junction to allow direct contact with the surface being measured. The 4-foot cable is terminated with a Type K miniature thermocouple connector with 0.312-inch (0.792mm) pin spacing. The probe can be used with any temperature measuring instrument that is designed to accept Type K thermocouples and has a miniature connector input.

SPECIFICATIONS

Type: K (Chromel vs Alumel)

Measurement Range: 20°C to 260°C (68°F to 500°F)

Accuracy (with respect to NBS tables):
±2.2°C (3.6°F) over the range of 20°C to 260°C (68°F to 500°F)

Output: 25°C (77°F) = 1.00 mV (reference junction at 0°C)

Seebeck Coefficient: 25°C (77°F) = 40.50 μV/°C

Measurement Time (Time Constant): 4 sec typical on metal surface; 15 sec max. for a 260°C change. See Applications Information below.

Maximum Voltage: 24V ac rms or 60V dc

Maximum Temperature of Tip: 260° C (500° F)

Cable:
Length: 4 ft
Insulation:
Material: PVC
Maximum Temperature: 105° C (220° F)

Voltage Rating: 1000V (between wire and outside of both layers of insulation)

Conductors:
Type: K
Size: AWG #24 stranded (7 strands of #32)
Length: 48 inches nominal

Polarity and Color Coding:
Chromel: + yellow
Alumel: - red
Outer Jacket: black

Handle:
Material: Acetal
Maximum Temperature: 105° C (220° F)

Connector:
Type: yellow mini-thermocouple connector with 0.312-inch pin spacing
Material: Valox
Maximum Temperature: 200° C (392° F)

Dimensions: 12.5 mm (½ inch) in diameter, 9.4 cm (3.75 inches) in length

Protection: Class 3. Relates solely to insulation and grounding properties defined in IEC 348.

MEASUREMENT CONSIDERATIONS

Instrument Compatibility

The 80PK-3 is designed to be compatible with any temperature measuring instrument that accepts K-type thermocouples, has a miniature thermocouple connector, and has cold reference junction compensation. Accuracy of the temperature measuring instrument must be considered along with the 80PK-3 accuracy specification in order to determine the overall accuracy of the combination.

Temperature Limitations

The probe tip has a continuous temperature rating of 260° C. However, the rest of the assembly is rated for a lower temperature. See the specifications for further information.

Media Limitations

The Type K thermocouple junction is compatible with clean oxidizing atmospheres.

Applications Information

At high temperatures, a surface temperature probe removes a small amount of heat from the measured surface. At 260°C on a polished metal surface, the temperature at a contact point will be lowered, typically not more than 2° C. Low temperatures at the contact point are less likely, and contact response time is quicker, on polished metal surfaces than on materials with low thermal conductivity, such as plastic and rough or contaminated surfaces. For all materials and surface textures, seating all probe legs will give the best thermal contact and measurement performance.

OPERATION

Use the 80PK-3 as follows:

1. Connect the 80PK-3 to a compatible Type K temperature measuring instrument using the miniature thermocouple connector.

2. Turn on the measuring instrument and select the appropriate range and scale.

3. Check the readout on the measuring instrument. With no heat or cold source applied to the bead, the measuring instrument should display the ambient (room) temperature. If the instrument does not readout properly, refer to the TROUBLESHOOTING section below.

MEASURING TECHNIQUE

Here are some suggestions for improving the accuracy of your temperature measurements:

1. When measuring higher than ambient temperatures, adjust the connection between the probe and the surface until you get the highest temperature reading. To ensure a good connection, see the suggestions above.

2. When measuring lower than ambient temperatures, adjust the connection between the probe and the surface until you get the lowest temperature reading. To ensure a good connection, see the suggestions above.

3. When measuring near ambient temperatures, make the reading when the multimeter readout is most stable.

TROUBLESHOOTING

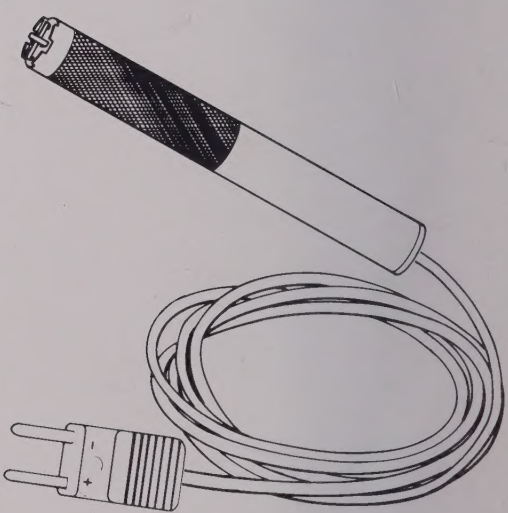
With no heat or cold applied to the probe, the measuring instrument should display the ambient temperature. If the measuring instrument does not readout properly, try the following:

1. Verify that the temperature measuring instrument is designed to be used with Type K thermocouples. It should have a yellow input connector and/or be marked "K".

2. Check for an open circuit indicator on the measuring instrument. Some temperature measuring instruments have a built-in circuit to indicate if the connected probe is open. (All Fluke instruments have this feature.) Refer to the measuring instrument's owner's manual to see if this feature is available.

   If you suspect a broken connection, use an ordinary ohmmeter to check its continuity from pin to pin. The ohmmeter should read 10 ohms or less if there is continuity.

3. Short the two input pins of the measuring instrument with a piece of wire. If the instrument is functioning, it should indicate the ambient temperature.



Instruction Sheet
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